

## CLAIMS

What is claimed is:

1. A method, comprising:  
5       interconnecting a compute node with a shared memory node via hardware over a link medium; and  
      providing a shared memory operating system extension layer.
2. The method of claim 1, further comprising interconnecting another compute node with  
10   the shared memory node via hardware over the link medium.
3. The method of claim 1, wherein the shared memory operating system extension layer includes an application programming interface.
- 15   4. The method of claim 1, providing the shared memory operating system extension layer includes providing a function call.
- 20   5. The method of claim 1, providing the shared memory operating system extension layer includes providing another function call.
- 25   6. The method of claim 4, wherein the function call includes a shared memory management function call.
7. The method of claim 6, wherein the shared memory management function call manages pools of shared memory.
8. The method of claim 6, wherein the shared memory management function call includes a shared memory allocation function call.

9. The method of claim 8, wherein the shared memory allocation function call allows applications to reserve varying lengths of contiguous shared memory to hold data.

10. The method of claim 9, wherein the varying lengths of contiguous shared memory are shared and updated by a plurality of processors.

11. The method of claim 6, wherein the shared memory management function call includes a shared memory release function call.

12. The method of claim 11, wherein the shared memory release function call allows applications to release varying lengths of contiguous shared memory.

13. The method of claim 6, wherein the shared memory management function call includes a shared memory ownership function call.

14. The method of claim 13, wherein the shared memory ownership function call marks shared memory regions as exclusive to at least one of a plurality of processors.

15. The method of claim 6, wherein the shared memory management function call includes a shared memory ownership transfer function call.

16. The method of claim 15, wherein the shared memory ownership transfer function call transfers ownership of shared memory regions from a first set of processors to a second set of processors.

17. The method of claim 4, wherein the function call includes an interprocessor synchronization function call.

18. The method of claim 17, wherein the interprocessor synchronization function call includes a global lock reservation identifier function call.

19. The method of claim 18, wherein the global lock reservation identifier function call reserves at least one of a plurality of global synchronization primitives.

5 20. The method of claim 17, wherein the interprocessor synchronization function call includes a global lock release identifier function call.

21. The method of claim 20, wherein the global lock release identifier function call releases at least one of a plurality of global synchronization primitives.

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22. The method of claim 17, wherein the interprocessor synchronization function call includes a global lock acquisition function call.

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23. The method of claim 21, wherein the global lock acquisition function call locks one or more global locks.

24. The method of claim 17, wherein the interprocessor synchronization function call includes a global lock release function call.

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25. The method of claim 24, wherein the global lock release function call unlocks at least one of a plurality of global locks.

26. The method of claim 4, wherein the function call includes an interprocessor communication function call.

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27. The method of claim 26, wherein the interprocessor communication function call includes a single processor signaling function call.

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28. The method of claim 27, wherein the single processor signaling function call sends a signal one of a plurality of processors.

29. The method of claim 26, wherein the interprocessor communication function call includes an all processor signaling function call.

5 30. The method of claim 29, wherein the all processor signaling function call sends a signal at least two of a plurality of processors.

31. The method of claim 26, wherein the interprocessor communication function call includes a single processor message sending function call.

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32. The method of claim 31, wherein the single processor message sending function call exchanges data among applications.

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33. The method of claim 32, wherein the single processor message sending function call contains a shared memory reservation and signaling function call.

34. The method of claim 26, wherein the interprocessor communication function call includes an all processor message sending function call.

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35. The method of claim 34, wherein the all processor message sending function call exchanges data among applications.

36. The method of claim 35, wherein the all processor message sending function call contains a shared memory reservation and signaling function call.

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37. A computer program, comprising computer or machine readable program elements translatable for implementing the method of claim 1.

38. An apparatus for performing the method of claim 1.

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39. A network, comprising the apparatus of claim 38.

40. An electronic media, comprising the computer program of claim 37.

5 41. An apparatus, comprising the electronic media of claim 40.

42. A kit, comprising the electronic media of claim 40.

43. The kit of claim 42, further comprising instructions.

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44. An apparatus, comprising:

a compute node;

a link medium coupled to the compute node; and

a shared memory node coupled to the link medium, the shared memory mode

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including a shared memory operating system extension layer.